



MONTGOMERY COUNTY FIRE AND RESCUE SERVICE DRIVER/OPERATOR TRAINING PROGRAM

Practical Application Guide Sheet

Engine: Pump Inspection & Knowledge

Candidate Performance Competency: Candidate will perform a daily checkout of the pump and associated components; including the main pump, pump operation, Class A foam systems, Class B foam system, Compressed Air Foam System (CAFS), fire hose, nozzles, and appliances. Candidate will demonstrate a thorough knowledge and understanding of the capabilities of the systems common to Montgomery County Engine Companies. During the physical checkout, the candidate will explain weekly and monthly maintenance procedures. The exact sequence of steps as listed in this PAGS are not critical, however the candidate must approach the inspection in methodical and logical manner.

Task	Value	Score
Walk Around		
1. Position the engine on a reasonably level stable surface.	1	
2. Apply parking brake, turn engine off and place wheel chock on the downhill side of the front or rear tire. (CFP)	2	
3. Check fluid level in CAFS air compressor fluid reservoir. Oil must be cool and not frothy.	2	
4. Ensure all discharge caps and intake plugs are present and secure.	2	
5. Open all bleeders and drains.	1	
6. Exercise gate valves for all pre-connected hoselines and lubricate as necessary.	2	
7. Close all bleeders and drains.	2	
8. Inspect all hose loads for the following: (CFP) a) proper length/amount of hose b) load configuration, proper ear lengths, stability of stacks c) nozzle patterns adjusted to straight stream d) nozzle bales closed e) no obvious damage to nozzles or hose f) secure retention nets/flaps	2	

Task	Value	Score
9. Candidate will verbalize the following for each separate hose load on the apparatus as applicable: (CFP) a) total length b) hose diameter c) nozzle type d) smooth bore diameter e) rated nozzle flow f) rated nozzle pressure g) product capabilities (water, solution, CAFS)	5	
10. Candidate will verbalize the corresponding manifold for each discharge. Explain the volume capabilities and product capabilities associated with each manifold.	5	
11. Inspect Humat Valve and accessory hydrant wrench. Inspect LDH Siamese. Ensure both appliances are properly secured and preconnected.	1	
12. Candidate will identify the manifold associated with the tank fill and pump cooler.	2	
13. Inspect all exterior compartments for correct contents and condition of items. Candidate will display a thorough knowledge of inventory prior to opening each compartment.	2	
14. Inspect Water/Oil Heat Exchanger. a) Check strainer for debris b) Candidate will describe the purpose and mechanics of the exchanger	2	
15. Inspect the Primer Pump. Candidate will explain the principle of the Primer Pump operation.	2	
16. Inspect the Gearbox Assembly. Candidate will explain the purpose of the Gearbox Assembly.	2	
17. Verify all relief valve discharges are secure, free of debris, and not capped.	2	
18. Verify that all discharge valves are closed prior to placing pump in gear. (CFP)	1	
Pump Engaged		
19. Start motor and view gauges for operation and normal readings.	1	
20. Engage pump. Listen for pump and air compressor to engage. See speedometer reading approximately 10-15 MPH. See green "Ok To Pump When Lit" indicator light in cab illuminated.	1	
21. Operator confirms the following: a) Pump panel gauges are illuminated, b) FoamLogix Pump is on, c) Air Compressor is on and producing pressure (red needle), d) positive discharge pressure on the Master Discharge Gauge, and e) "Tank To Pump" valve is open.	1	

Task	Value	Score
22. Open Pump Cooler valve. Partially open Tank Fill valve to aid with pump cooling.	1	
23. Cycle the Tank to Pump valve while visualizing the air actuated piston for operation.	1	
24. Regarding the CAFS Pro Controller, the candidate will: a) verbalize the four functions monitored (Air Flow in CFM, Air to Water Injection Ratio, Compressor Temperature, Compressor Run Hours) b) check the four functions for error codes c) verbalize the air ratio ranges for wet, fluid, and dry CAFS foam (wet = 0.5 to 1.5; fluid = 2.0 to 3.0; dry = 11)	4	
25. Regarding the FoamLogix Controller, the candidate will: a) verbalize the four functions monitored (Current Product Flow in GPM Through Manifold, Current % Foam Injection Rate, Total Water Flowed in Current Session, Total Class A Foam Concentrate used in Current Session) b) interpret the LED lights on the controller (No LED = Off, 1 LED = On, All LEDs = Max of 5 GPM Foam Injection)	3	
26. Regarding the TPM, the candidate will: (CFP) a) check operation of the TPM at 100psi b) check operation of the TPM at 150psi c) note that the internal relief valve is activating at the correct pressure on the master discharge gauge (solid indicator light)	2	
27. With TPM set just above 100psi, throttle up to generate 100psi discharge pressure and observe the Master Discharge Gauge for proper tracking of water and air pressures.	1	
28. Verify the CAFS air compressor is properly cooling by adjusting the throttle to achieve 100psi discharge pressure. Maintain 100psi for 15 minutes and monitor the compressor. a) Candidate will verbalize the settings for the audible overheat alarm (205°F) b) Candidate will verbalize the settings for auto-shutoff (220°F)	2	
29. With the motor at idle, place the CAFS Pro controller in standby mode. Turn the CAFS Pro controller off and then turn the FoamLogix pump off.	1	
30. Regarding the Environmentally Sensitive Primer (ESP), the candidate will: a) adjust the throttle to 1,100rpm and engage the primer until water discharges under the vehicle. b) not "bump" test nor engage the primer for greater than 45 seconds. c) explain the mechanics of the primer.	2	

Task	Value	Score
31. Regarding the 4-way priming valve, the candidate will: a) move the 4-way priming valve through all four settings. Operation should be smooth. b) explain the purpose of the 4-way priming valve.	1	
32. Verify the air horn switch functions at the pump panel.	1	
33. Regarding the Direct Tank Fill (Auto Fill), the candidate will do the following in the order shown: a) disconnect the rear intake hose b) set the Auto Fill to "manual" mode c) open the Auto Fill. Note the valve status light changes to green indicating open. d) return the Auto Fill to "auto" mode e) ensure the valve status light changes to red indicating closed. The candidate will explain the function and limitations when using the Auto Fill during water supply.	2	
34. Regarding the pump panel discharges, the candidate will do the following in the order shown: a) adjust TPM to just above 150psi. b) engage primer until water discharges beneath the truck c) ensure Drivers No.1, Drivers No.2, Officers No.1, and Officers No.2 discharges are securely capped (CFP) d) open the four discharges e) adjust discharge pressure to 150psi f) compare the readings on the Master Discharge gauge and all four discharge gauges. Note any variations over 10psi as a defect. g) return throttle to idle h) close all discharges i) open appropriate bleeders to relieve pressure on the discharges (CFP) j) adjust TPM to zero Account for each manual override knob.	4	
35. Disengage the pump.	1	
36. Regarding each MIV, the candidate will: a) Remove each intake cap b) Open and close each MIV using the switch at the pump panel and verify the valve operated. c) Account for each manual override knob. d) Visually inspect each intake screen and explain purpose of screens. (prevent debris from entering the pump; sacrificial anode to reduce corrosion of internal pump components)	3	
37. Candidate will verify that the CAFS manifold automatically flushes by discharging solution to the ground.	1	

Task	Value	Score
38. Note the fluid levels indicated at the pump panel for the Class A and Class B foam tanks.	2	
39. Note the fluid levels indicated at the pump panel for the water tank and visually verify the tank level.	2	
40. Inspect and manipulate the deck gun. Candidate will verbalize the tip sizes and associated flows for each. (1 3/8", 1 1/2", 1 3/4", 2"; 500gpm, 600gpm, 800gpm, 1000gpm)	5	
Prepare Engine for Service		
41. Following each pump engagement, inspect and clean as necessary the strainer in the Water/Oil Heat Exchanger.	2	
42. Remove all discharge caps and intake plugs to drain water. Secure all caps and plugs. Connect rear intake hose. Lubricate parts as necessary.	2	
43. Verify the following settings to ready the Engine for service: a) throttle is at idle b) TPM is at zero c) Pump Cooler is open d) Engine Cooler is closed e) water tank is full	2	
Weekly Maintenance		
44. Candidate will verbalize the sequence to exercise and verify operation of the Auto Fill. The sequence is as follows: a) ensure Auto Fill switch is in the "Automatic" position. b) establish a pressurized water source to the rear MIV c) open a discharge to flow water from the water tank d) observe that Auto Fill valve maintains the water tank level throughout (valve opens at 3/4 and closes at 7/8)	2	
45. Candidate will verbalize the sequence to exercise and verify operation of the Outboard Relief Valves on Officers High Flow discharges. The sequence is as follows: a) Adjust TPM to approximately 220psi b) Establish a positive pressure water source via MIV c) Ensure High Flow Discharges are capped d) Open "Officers No.1" discharge e) Increase discharge pressure until water discharges to the ground from the relief valve. Note the pressure on the discharge gauge. (factory set at 185psi; should be ~ 210psi; do not field-adjust) f) Reduce throttle to idle. Close discharge valve and open bleeder. g) Repeat steps for "Officers No.2" discharge.	2	

Task	Value	Score
<p>46. Candidate will verbalize the sequence to exercise and verify operation of the TPM external relief valve. The sequence is as follows:</p> <ul style="list-style-type: none"> a) Establish a positive pressure water source via MIV b) Adjust TPM to approximately 200psi c) Increase discharge pressure to 150psi d) Decrease TPM setting until the external relief valve discharges water to the ground. Verify that the orange indicator light is flashing. e) Increase the TPM setting until the external relief valve closes. f) Reduce throttle to idle and close the MIV. 	2	
47. Lubricate all threads and Storz caps on intakes and discharges.	1	
48. Open drains on brake system air tanks to drain accumulated water.	1	
49. Candidate will verbalize the procedure to back flush the pump. See PAGS for Back Flush Centrifugal Pump. Back flushing will also occur following drafting operations.	1	
Monthly Maintenance		
<p>50. Candidate will demonstrate a working knowledge of lubrication of the following valves:</p> <ul style="list-style-type: none"> a) CAFS Air Compressor b) LDH Discharge c) Auto Tank Fill d) Tank to Pump <p>Candidate will explain what grease to use, how much grease to inject, what position the valve should be in while injecting the grease, and the steps to exercise each individual valve.</p>	2	
<p>51. Candidate will verbalize the procedures for flushing the Class B system. The procedure is as follows:</p> <ul style="list-style-type: none"> a) Flush hose and eductor with plain water. b) Flush piping by attaching a garden hose to the pump panel fitting and flowing plain water. 	2	
52. Candidate will verbalize the procedures for draining water from the CAFS air compressor oil reservoir.	1	
Total Points	100	

Critical Fail Points

Failure to successfully perform any of the following components will result in an automatic failure of this evolution regardless of total score.

- a) Failure to use wheel chock
- b) Activation of TRV
- c) Failure to ensure discharge caps are secured before pressurization
- d) Failure to relieve pressure from discharges following testing
- e) Unintended charging of any preconnected hose loads (exception: mechanical failure of discharge valves or seals)
- f) Improper testing of the TPM at any stage
- g) Improper sequencing of steps that result in incomplete testing of functions or components
- h) Failure to ensure all equipment is secured to the apparatus
- i) Failure to ensure proper hose and appliance configurations
- j) Failure to correctly explain hose loads, nozzles, and product capabilities of hose and preconnected hoselines

Evaluator: Initial beside the final outcome of the exam below.

____ **PASS** ____ **FAIL – Overall Points** ____ **FAIL – Critical Failure Point**

Evaluator Name

Date

Evaluator Signature